Please replace the paragraph beginning at page 3, line 24 with the following rewritten paragraph:

For coding an image signal of an object, (an image having an arbitrary shape), a waveform transform which performs signal processing adapting to a shape of the object, for example, shape adaptive DCT, or waveform transform to a padded image signal, is employed. In the method, specifically, padding is performed to an image signal forming an image space (rectangular region) by replacing values of pixels in its insignificant region with padding pixel values obtained by a prescribed method, and then a conventional 8 X 8 cosine transform is performed to the padded image signal. The insignificant region is a region outside an object in the rectangular region, and comprises pixels which have no values for displaying the object. In other words, an image signal of the insignificant region comprises so-called insignificant sample values. Also, the 8 X 8 cosine transform is a waveform transform which performs cosine transform to the image signal of the rectangular region for each image space comprising 8 X 8 pixels.

B2 cancl.

Please replace the paragraph beginning at page 4, line 17 with the following rewritten paragraph:

As a method for eliminating redundant signals between adjacent frames, there is a method for obtaining a difference between an image signal of a target macroblock to be coded and its prediction signal for each image space (macroblock) comprising 16 X 16 pixels, as a prediction error signal (difference signal). Here, it is assumed that the prediction signal is an image signal of a prediction region obtained by motion compensation. The motion compensation process detects a region comprising 16 X 16 pixels corresponding to an image signal in a coded or decoded frame where a difference between the image signal of the target macroblock and the image signal is the smallest, as a prediction region.

B3 cancl.

Please replace the paragraph beginning at page 5, line 14 with the following rewritten paragraph:

As a solution to this, padding is performed to the image signal of the prediction region by replacing insignificant sample values by prescribed padding values, and then a difference between the padding prediction signal and the image signal of the target macroblock is computed as a difference signal (prediction error signal), which is subjected to transformation for coding. The padding of the prediction signal can suppress the difference signal.

B4 canel.

Please replace the paragraph beginning at page 6, line 13 with the following rewritten paragraph:

In the interlaced image, especially in a case where motion of an object is large, there is low correlation of pixel values between adjacent scanning lines. Figure 18 schematically shows an example of an arrangement of pixel values which shows the low correlation of pixel values between adjacent scanning lines in the interlaced image, as arrangement of pixel values in an image space 301.

B5 canel.

Please replace the paragraph beginning at page 7, line 11 with the following rewritten paragraph:

Next, a prior art padding method and its padding result will be described with reference to Figures 18 and 19.

B6 canel

Please replace the paragraph beginning at page 9, line 19 with the following rewritten paragraph:

Resampling which divides pixels forming the image space 380 into pixels corresponding to odd-numbered and even-numbered fields based on an assumption that the image space 380 is a frame, results in an image space 381 comprising plural pixels corresponding to the odd-numbered field and an image space 382 comprising plural pixels corresponding to the even-numbered field asa shown in figure 20. In the image spaces 381 and 382 corresponding to these respective fields,

B7 cont'd

B7 cancl sample values of pixels are non-uniform, which introduces high-frequency components into image signals in image spaces 381 and 382.

Please replace the paragraph beginning at page 10, line 23 with the following rewritten paragraph:

B8 cancl. Further, a similar problem occurs in padding methods other than the above, which computes padding values using significant sample values adjacent to insignificant pixels in the horizontal or vertical direction.

Please insert the title Summary of the Invention before the paragraph beginning at page 11, line 2 and delete the title Disclosure of the Invention beginning at page 11, line 13 of the specification.

Please replace the paragraph beginning at page 11, line 14 with the following rewritten paragraph:

B9 According to a first aspect of the present invention, a digital image padding method is provided for performing padding of pixel values to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising significant pixels and insignificant pixels, comprises a pixel rearrangement step in which plural pixels in the original image space are grouped according to a prescribed rule, to form plural small image spaces each comprising pixels of the same group; and a pixel padding step in which values of insignificant pixels in each small image space are replaced with padding pixel values generated by a prescribed method.

Please replace the paragraph beginning at page 12, line 25 with the following rewritten paragraph:

B10 cont'd According to a second aspect of the present invention, in the digital image padding method of the first aspect of the invention, in the pixel rearrangement step, sampling is performed by extracting pixels every (N + 1) -th (N: positive integer) pixel in a prescribed direction of the image

B10 cancel

space (N + 1) times by using the first to the (N + 1) -th pixels as starting sample pixels, to form (N + 1) pieces of small image spaces each comprising a prescribed number of pixels obtained by one sampling.

Please replace the paragraph beginning at page 13, line 18 with the following rewritten paragraph:

B11 cancel.

According to a third aspect of the present invention, in the digital image padding method of the second aspect of the invention, operation values obtained by performing operation on values of significant pixels in an N-th (n=1, 2, ..., N + 1) small image space are used as the padding pixel values for replacing the values of insignificant pixels in the n-th small image space.

Please replace the paragraph beginning at page 14, line 6 with the following rewritten paragraph:

B12 cancel.

According to a fourth aspect of the present invention, the digital image padding method of the second aspect of the invention further comprises an image space restoring step in which plural pixels forming padded small image spaces are rearranged following a rule adapted to the prescribed rule of the grouping so that these pixels forms a restored image space which has the same pixel rearrangement as the original image space.

Please replace the paragraph beginning at page 14, line 23 with the following rewritten paragraph:

B13

According to a fifth aspect of the present invention, in the digital image padding method of the fourth aspect of the invention, operation values obtained by performing operation on values of significant pixels in an n-th (n=1, 2, ..., N+1) small image space are used as the padding pixel values for replacing the values of insignificant pixels in the n-th small image space.

Please replace the paragraph beginning at page 15, line 11 with the following rewritten paragraph:

B14 cancel

According to a sixth aspect of the present invention, in the digital image padding method of the first aspect of the invention, in the pixel rearrangement step, sampling is continuously performed twice using the first and second pixel rows as starting sample pixel rows, by extracting pixels on every other pixel row in the vertical direction of the original image space, to form first and second small image spaces each comprising a prescribed number of pixels obtained by the first and second samplings, respectively.

Please replace the paragraph beginning at page 16, line 10 with the following rewritten paragraph:

B15 cancel.

According to a seventh aspect of the present invention, a digital image padding method for performing padding of pixel values to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising significant pixels and insignificant pixels, comprises the steps of dividing the original image space into a first small image space comprising pixels on odd-numbered pixel rows in the original image space and a second small image space comprising pixels on even-numbered pixel rows in the original image space; and generating first padding pixel values from values of significant pixels in the first small image space and replacing values of insignificant pixels in the first small image space with the first padding pixel values, and generating second padding pixel values from values of significant pixels in second small image space and replacing values of insignificant pixels in the second small image space with the second padding pixel values.

Please replace the paragraph beginning at page 17, line 18 with the following rewritten paragraph:

B16 cont'd

According to an eighth aspect of the present invention, a digital image padding method for performing padding to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising significant pixels and insignificant pixels, by replacing

B16 cancel

values of insignificant pixels with padding pixel values determined from values of significant pixels in the original image space, wherein, significant pixels which have values used for determining the padding pixel values are pixels other than pixels adjacent to insignificant pixels to be padded.

Please replace the paragraph beginning at page 18, line 16 with the following rewritten paragraph:

B17 cancel.

According to a ninth aspect of the present invention, in the digital image padding method of the eighth aspect of the invention, significant pixels which have values used for determining the padding pixel values are one pixel apart from the insignificant pixels to be padded.

Please replace the paragraph beginning at page 19, line 8 with the following rewritten paragraph:

B18

According to a tenth aspect of the present invention, an image processing apparatus for performing image coding which comprises a correlation identifying device for identifying correlation between pixel values of a digital image signal and outputting a sample identifier according to the identification result, a coding section for performing differential coding to the digital image signal by the use of a prediction image signal of the digital image signal according to the sample identifier and outputting a coded image signal, and a predicting section for producing the prediction image signal based on a decoded image signal in which the coded image signal has been locally decoded, the coding section comprises a subtracter for computing difference between the digital image signal and the prediction image signal as a difference signal; a data compressing device for compressing the difference image signal to produce a compressed image signal; and a variable length encoder for performing variable length coding to the compressed difference signal, and the predicting section comprises a data expanding device for expanding the compressed difference signal to produce an expanded difference signal; an adder for adding the expanded difference signal to the prediction image signal to produce a decoded image signal; a padding device for performing padding according to the sample identifier by rearranging pixels in an image space formed by the decoded image signal and replacing values of insignificant pixels in the image space where the pixels have been rearranged

B18 cancel

with padding pixel values generated by a prescribed method; and a prediction image signal producing device for producing the prediction image signal from the padded decoded image signal according to the sample identifier.

Please replace the paragraph beginning at page 20, line 15 with the following rewritten paragraph:

B19 cancel.

In the digital processing apparatus thus constructed, the predicting section for producing the prediction image signal of the digital image signal, comprises the padding device for performing padding of pixel values to the decoded image signal in which the coded difference signal has been locally decoded in its differential coding process, and is used for producing the prediction image signal from the padded decoded image signal, the padding device first rearranging pixel values of the decoded image signal and then replacing the values of the insignificant pixels of the decoded image signal with the prescribed padding pixel values. Therefore, when performing differential coding to the digital image signal of the interlacing scanned image or the image of a stripe pattern having an arbitrary shape, it is possible in padding process to avoid introduction of high-frequency components into the prediction image signal for use by differential coding, differential coding can be performed to the interlacing scanned image while suppressing degradation of coding efficiency resulting from the padding.

Please replace the paragraph beginning at page 21, line 10 with the following rewritten paragraph:

B20 cancel.

According to an eleventh aspect of the present invention, in the image processing apparatus of the tenth aspect of the invention, the coding section further comprises a padding device for performing padding to the difference image signal according to the sample identifier by rearranging pixels in the image space formed by the difference image signal and replacing values of insignificant pixels in the image space where the pixels have been rearranged with padding pixel values generated by a prescribed method, and the data compressing device performs information compression to the padded difference image signal to produce a compressed difference image signal.

Please replace the paragraph beginning at page 21, line 21 with the following rewritten paragraph:

In the image processing apparatus thus constructed, pixel values of the difference image signal input to the data compressing device are rearranged, and then padding is performed by replacing values of the insignificant pixels of the difference signal with the prescribed padding pixel values. Therefore, it is possible to avoid introduction of high-frequency components into the image signal input to the data compressing means. As a result, when performing differential coding to the digital image signal of the interlacing scanned image or the image of a stripe pattern having an arbitrary shape, waveform transform such as DCT is performed with high efficiency.

B21 cancl.

Please replace the paragraph beginning at page 22, line 8 with the following rewritten paragraph:

According to a twelfth aspect of the present invention, an image processing apparatus for performing image decoding which comprises a reproducing section for reproducing a coded image signal in which a digital image signal has been coded by the use of a prediction image signal of the digital image signal and outputting a reproduced image signal, and a predicting section for producing the prediction image signal from the reproduced image signal, and the reproducing section comprise a data analyzing unit for analyzing the coded image signal to extract a compressed difference signal of the digital image signal and a sample identifier indicating correlation between pixel values of the digital image signal from the coded image signal; a data expanding device for expanding the compressed difference signal to produce an expanded difference signal; and an adder for adding the expanded difference signal to the prediction signal to produce the reproduced image signal, and in the predicting section, using at least one of the reproduced image signal and the prediction image signal obtained from the reproduced image signal as a signal to be padded, padding is performed to the signal to be padded according to the sample identifier, by rearranging pixels in an image space formed by the signal to be padded and replacing values of insignificant pixels in the image space where the pixels have been rearranged with padding pixel values generated by a prescribed method.

B22 cancl.

Please replace the paragraph beginning at page 23, line 8 with the following rewritten paragraph:

In the image processing apparatus thus constructed, the predicting section for producing the prediction image signal of the digital image signal comprises a padding device for performing padding of pixel values to the reproduced image signal or the prediction image signal of the digital image signal as the signal to be padded, and the padding process rearranges pixel values of the signal to be padded and then replaces values of insignificant pixels of the signal to be padded with prescribed padding pixel values. Therefore, when decoding a coded difference signal of the interlacing scanned image or the image of a stripe pattern having an arbitrary shape, it is possible to avoid introduction of high-frequency components into the prediction image signal for use by the differential decoding. As a result, differential decoding adapted to differential coding which suppresses degradation of coding efficiency resulting from padding of pixel values, is realized.

B23 cancel.

Please replace the paragraph beginning at page 23, line 25 with the following rewritten paragraph:

According to a thirteenth aspect of the present invention, in the image processing apparatus of the twelfth aspect of the invention, the predicting section further comprises a padding device for performing padding to the reproduced image signal frame by frame or field by field according to the sample identifier, and a frame memory for storing a padded reproduced signal in which the reproduced image signal has been padded, and outputs the padded reproduced image signal stored in the frame memory to the reproducing section as the prediction image signal.

B24 cancel.

Please replace the paragraph beginning at page 24, line 17 with the following rewritten paragraph:

According to a fourteenth aspect of the present invention, in the image processing apparatus of the twelfth aspect of the invention, the predicting section further comprises a frame memory for storing the reproduced image signal, and a padding device for performing padding to the prediction image signal extracted from the reproduced image signals stored in the frame memory frame by

B25 cont'd

B25 cancel- frame or field by field according to the sample identifier, and outputs the padded prediction image signal to the reproducing section.

Please replace the paragraph beginning at page 25, line 12 with the following rewritten paragraph:

According to a fifteenth aspect of the present invention, an image processing apparatus for performing image decoding, which comprises a reproducing section for reproducing a coded image signal in which a digital image signal has been coded by the use of a prediction image signal of the digital image signal and outputting a reproduced image signal, and a predicting section for producing the prediction image signal from the reproduced image signal, the reproducing section comprises a data analyzing unit for analyzing the coded image signal to extract a compressed difference signal B26 cancel. of the digital image signal and a sample identifier indicating correlation between pixel values of the digital image signal from the coded image signal; a data expanding device for expanding the compressed difference signal to produce an expanded difference signal; and an adder for adding the expanded difference signal to the prediction image signal to produce the reproduced image signal, and the predicting section comprises a padding device for performing padding to the reproduced image signal according to the sample identifier, by replacing values of insignificant pixels in an image space formed by the reproduced image signal with padding pixels values generated from values of significant pixels other than pixels adjacent to the insignificant pixels; and a rearrangement device for rearranging pixels in an image space formed by the padded reproduced image signal, according to the sample identifier.

Please replace the paragraph beginning at page 27, line 4 with the following rewritten paragraph:

According to a sixteenth aspect of the present invention, a data recording medium for storing B27 cont'd a program which makes a computer perform padding of pixel values to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising

B27 cancl. significant pixels and insignificant pixels, and the program makes the computer perform padding of the pixel values according to the digital image padding method of the first aspect of the invention.

Please replace the paragraph beginning at page 27, line 18 with the following rewritten paragraph:

B28 cancl. According to a seventeenth aspect of the present invention, a data recording medium for storing a program which makes a computer perform padding of pixel values to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising significant pixels and insignificant pixels, and the program makes the computer perform padding of pixel values according to the digital image padding method of the seventh aspect of the invention.

Please replace the paragraph beginning at page 28, line 6 with the following rewritten paragraph:

B29 cancl According to an eighteenth aspect of the present invention, a data recording medium for storing a program which makes a computer perform padding of pixel values to a digital image signal forming an original image space comprising an image having an arbitrary shape and comprising significant pixels and insignificant pixels, and the program makes the computer perform padding of pixel values according to the digital image padding method of the eighth aspect of the invention.

Please replace the paragraph beginning at page 28, line 19 with the following rewritten paragraph:

B30 cancl According to the nineteenth aspect of the present invention, a data recording medium for storing a program which makes a computer perform image signal coding, and the program makes the computer perform differential coding to a digital image signal by image processing apparatus of the tenth aspect of the invention.

Please replace the paragraph beginning at page 29, line 4 with the following rewritten paragraph:

B31 cancel

According to a twentieth aspect of the present invention, a data recording medium for storing a program which makes a computer perform image signal decoding, and the program makes the computer perform differential decoding to the digital image signal by the image processing apparatus of the twelfth aspect of the invention.

Please replace the paragraph beginning at page 29, line 14 with the following rewritten paragraph:

B32 cancel

According to a twenty-first aspect of the present invention, a data recording medium for storing a program which makes a computer perform image signal decoding, and the program makes the computer perform differential decoding to the digital image signal by the image processing apparatus of the fifteenth aspect of the invention.

Please replace the paragraph beginning at page 32, line 4 with the following rewritten paragraph:

B33 cancel.

Figure 15 is a block diagram for explaining an image decoding apparatus according to a modification 1 of the fourth embodiment.

Please replace the title beginning at page 32, line 21 with the following rewritten title:

Description of the Preferred Embodiments

Please replace the paragraph beginning at page 35, line 12 with the following rewritten paragraph:

B34 cont'd

Also, the original image space 301 may be a region of the object (object region) itself comprising the object, or may be one of plural image spaces (blocks) each comprising a prescribed number of pixels (for example N x M samples), into which region is divided. In this embodiment,

B34 cancel for convenience, assume that digital image signals of object regions are sequentially input frame by frame in step S11.

Please replace the paragraph beginning at page 38, line 3 with the following rewritten paragraph:

B35 cancel Comparing these small image spaces resulting from padding to the odd-numbered field image 381 and the even-numbered field image space 382 (see figure 20) obtained by the prior art method, sample values of pixels in the small image spaces 405 and 406 (see figure 3) are uniform, which shows that high-frequency components are not introduced into the image signals of these small images.

Please replace the paragraph beginning at page 41, line 1 with the following rewritten paragraph:

B36 Concel Subsequently, modifications 1-3 of the first embodiment will be described.

Please replace the paragraph beginning at page 41, line 8 with the following rewritten paragraph:

B37 cancel In this digital image padding method of the modification 1 of the first embodiment, a process for merging pixels in step S16 is added to the steps S11-S15 in the digital padding method of the first embodiment in figure 1.

Please replace the paragraph beginning at page 43, line 15 with the following rewritten paragraph:

B38 cancel In the padding method of the modification 2 of the first embodiment, in step S51, a digital image forming a prescribed original image space where pixels are arranged in a matrix is input. Subsequently in step S52, the degree of correlation of pixel values between adjacent pixel columns is computed for the original image space. More specifically, in this modification, differences of sample values of pixels between each pair of adjacent odd-numbered and even-numbered pixel

B38 cancel

columns in the original images space are computed, and absolute values of the differences are added for each pair of odd-numbered and even-numbered pixel columns, to generate first evaluation values.

Please replace the paragraph beginning at page 47, line 22 with the following rewritten paragraph:

B39 cancel

In the padding method of the modification 3 of the first embodiment, in step S61, a digital image signal forming a prescribed original image space in which pixels are arranged in a matrix input. In this modification 3, suppose that the digital image signal corresponds to the interlaced image, and forms the image space 301 shown in figure 2.

Please replace the paragraph beginning at page 49, line 4 with the following rewritten paragraph:

B40 cancel

Figure 7 is a diagram for explaining field by field padding of the original image space 301 in figure 2. Figure 7 (a) shows a small image space 701 corresponding to the odd-numbered field in the original image space 301, and a small image space 703 obtained by padding the small image space 701. Figure 7 (b) shows a small image space 702 corresponding to an even-numbered field in the original image space 301, and shows a small image space 704 obtained by padding the small image space 702.

Please replace the paragraph beginning at page 54, line 22 with the following rewritten paragraph:

B41 cancel

The image coding apparatus 100a further includes a subtracter 102 for outputting difference between the blocked image signal Bg of the target block and the prediction signal Prg as a difference signal (prediction error signal) Dg, a data compressing device 110 for performing information compression to the output Dg of the subtracter 102 according to the sample identifier Di and outputting a compressed difference signal Qg, and a variable length encoder (VLC) 103 for performing variable length coding to the output Qg of the data compressing device 110 and outputting a coded image signal Eg.

Please replace the paragraph beginning at page 55, line 8 with the following rewritten paragraph:

The data compressing device 110 includes a pixel rearrangement unit 113 for rearranging pixels of a difference image signal formed by the difference signal Dg according to the sample identifier Di, a DCT unit 111 for performing discrete cosine transform to an output PDg of the pixel rearrangement unit 113, and a quantizer 112 for quantizing an output Tg of the DCT unit 111 and outputting quantization coefficients as the compressed difference signal Qg. The discrete cosine transform is performed for each of 4 blocks each comprising 8 x 8 pixels into which the block comprising 16 x 16 pixels is divided. Where the rearrangement has been performed, a block 250c is divided into small blocks 251-254 as shown in figure 10 (c), whereas where the rearrangement has not been performed, a block 250b is divided into small blocks 255-258 as shown in figure 10 (b).

Please replace the paragraph beginning at page 56, line 7 with the following rewritten paragraph:

The predicting section 120a includes a data expanding device 130 for performing expansion to the output Qg of the data compressing device 110 and outputting an expanded difference signal Itg, and an adder 123 for adding the expanded difference signal Itg to the prediction image signal Prg and outputting a restored image signal Lrg. The data expanding device 130 includes an inverse quantizer 121 for inversely quantizing the output Qg of the data compressing device 110, and an IDCT unit 122 for performing inverse DCT to an output IQg of the inverse quantizer 121 by transforming data in a frequency domain into data in a spatial domain, and outputting the expanded difference signal Itg.

Please replace the paragraph beginning at page 56, line 19 with the following rewritten paragraph:

The predicting section 120a further includes a padding device 150 for performing padding to the restored image signal Lrg from the adder 123 according to the sample identifier Di, and a

B44 Cancel

prediction signal producing device 140 for producing the prediction image signal Prg from a padded restored image signal Pag.

Please replace the paragraph beginning at page 56, line 25 with the following rewritten paragraph:

B45 Cancel

The prediction signal producing device 140 includes a frame memory 124 for storing the output Pag of the padding device 150, a motion detecting unit (ME) 125 for computing a motion vector MV of the target block based on the image data Mg stored in the frame memory 124, the blocked image signal Bg, and the sample identifier Di and outputting the MV, and a motion compensating unit (MC) 126 for generating an address Add1 of the frame memory 124 according to the motion detecting unit 125 and outputting an image signal in a memory area of the address Add1 as the prediction signal Prg. The motion detecting unit 125 is used for generating a motion vector of a frame and a motion vector of a field according to the sample identifier Di. The motion vector MV and the sample identifier Di are variable length coded by the variable length encoder 103 together with the compressed difference signal Qg.

Please replace the paragraph beginning at page 57 line 16 with the following rewritten paragraph:

B45 Cancel

As shown in figure 9 (b), the padding device 150 includes a frame padding unit 128a for padding the output Lrg of the adder 123 frame by frame, a field padding unit 128b for padding the restored image signal Lrg from the adder 123 field by field, a primary switch 127a provided at a primary stage of these padding units, for supplying one of the padding units with the restored image signal Lrg from the adder 123, a secondary switch 127b provided at a next stage of these padding units, for selecting one of outputs Pa1 and Pa2 of respective padding units according to the sample identifier Di, and a pixel rearrangement unit 129 for receiving a padded restored signal as a selected signal Spa from the secondary switch 127b and rearranging pixels in an image space formed by the padded restored image signal.

Please replace the paragraph beginning at page 58 line 23 with the following rewritten paragraph:

B 46 cont'd

Next, a data structure of a coded image signal output from the image coding apparatus 100a will now be described. Figure 11 schematically shows a data structure of the coded image signal.

Please replace the paragraph beginning at page 59 line 2 with the following rewritten paragraph:

In this bit stream 200, a bit string F corresponding to a frame image comprises a synchronous image signal 203 indicative of a starting point of a code string, a quantization step value 204 indicative of a quantization scale (quantization step) for use by quantization in coding process, and data D (1), D (2), D (3), . . ., D (i), corresponding to blocks (macroblocks) MB (1), MB (2), MB (3), . . ., MB (i) each comprising 16 x 16 pixels. Reference numerals 205, 208, and 211 designate sample identifiers each indicating whether or not correlation between pixels in fields is higher than correlation between pixel values in a frame. Reference numerals 206, 209, and 212 designate variable length coded motion vectors. Reference numerals 207, 210, and 213 designate DCT coefficients of subblocks each comprising 8 x 8 pixels of each block. The data D (1), data D (2), and D (3) corresponding to respective macro blocks comprises, the sample identifier 205, the motion vector 206, and the DCT coefficient 207, the sample identifier 208, the motion vector 209, and the DCT coefficient 210, and the sample identifier 211, the motion vector 212, and the DCT coefficient 213, respectively. In figure 11, reference numeral 214 designates a synchronous image signal of a frame subsequent to the frame F.

B 47 cont'd

Please replace the paragraph beginning at page 61 line 1 with the following rewritten paragraph:

When the difference signal Dg is supplied to the data compressing device 110, the pixel rearrangement unit 113 subjects the difference signal Dg to rearrangement according to the sample identifier Di. Specifically, where the digital image signal corresponds to the interlaced image, the difference signal Dg is subjected to rearrangement and input to the DCT unit 111, whereas where

B 48 cont'd

the digital image signal corresponds to the progressive image, the difference signal Dg is directly input to the DCT unit 111 without rearrangement. The DCT unit 111 performs DCT to the output PDg of the pixel rearrangement unit 113. More specifically, for the block corresponding to the interlaced image, the block is divided into subblock as shown in figure 10 (c), and for the block corresponding to the progressive image, the block is divided into subblocks as shown in figure 10 (b), and then the output PDg is subjected to DCT for each subblock. The quantizer 112 quantizes an output Tg of the DCT unit 111 by a quantization step and outputs quantization coefficients Qg of the difference signal to the variable length encoder 103 and the information expanding section 130.

Please replace the paragraph beginning at page 62 line 8 with the following rewritten paragraph:

In the padding device 150, the restored image signal Lrg is supplied to one of the frame padding unit 128a and the field padding unit 128b through the switch 127a. At this time, switching of the switch 127a is controlled according to the sample identifier Di. Where a value of the sample identifier Di is 1, that is, there is high correlation between pixels in the fields, the restored image signal Lrg is supplied to the field padding unit 128b through the switch 127a and is subjected to intra-field padding therein. Specifically, as shown in figure 10(c), padding is performed to the restored image signals of small blocks 251 and 252 composed of lines of the first field of the restored image space 250c at a time, and the restored image signals of small blocks 253 and 254 composed of lines of the second field of the restored image space 250c at a time.

Please replace the paragraph beginning at page 65 line 9 with the following rewritten paragraph:

In an image coding apparatus 100b of the modification 1 of the third embodiment, only a predicting section 120b differs from that of the image coding apparatus 100a of the third embodiment, and in the predicting section 120b of the image coding apparatus 100b, the padding device 150 of the predicting section 120a of the first embodiment is replaced with a merging unit 151

B50 canc

which performs merging wherein pixels in an image space formed by the restored image signal Lrg from the adder 123 are rearranged, and a padding device 150b which performs padding to an output of the merging unit 151.

Please replace the paragraph beginning at page 65 line 19 with the following rewritten paragraph:

B51 canc

The merging unit 151 is, as shown in figure 10 (d), used for rearranging pixels by alternately arranging pixels rows in the upper region 250d1 and pixel rows in the lower region 250d2 of the image space 250d. The padding device 150b includes the primary and secondary switches 127a and 127b, the frame padding unit 128a, and the field padding unit 128b of the padding device 150 of the third embodiment, the field padding unit 128b performing padding by the digital image padding method of the second embodiment. The other components are identical to those of the third embodiment.

Please replace the paragraph beginning at page 66 line 8 with the following rewritten paragraph:

B52 canc

Figure 13 is a diagram showing an image coding apparatus according to a modification of the third embodiment of the present invention, wherein figure 13(a) shows an entire construction of the image coding apparatus and figure 13(b) shows a padding device 150c of the data compressing device 110c of the image coding apparatus.

Please replace the paragraph beginning at page 66 line 14 with the following rewritten paragraph:

B53 canc

In an image coding apparatus 100c of the modification 2 of the third embodiment, only a data compressing device 100c differs from that of the image coding apparatus 100a of the third embodiment, and the data compressing device 110c of the image coding apparatus 10c is provided with a padding device 150c which performs padding to an output PDg of the pixel rearrangement unit 113 between the pixel rearrangement unit 113 and the DCT unit 111 at the next stage of the data compressing device 110 of the third embodiment.

Please replace the paragraph beginning at page 66 line 23 with the following rewritten paragraph:

B54 Cont'd

The padding device 150c includes a frame padding unit 158a for performing padding to the output PDg of the rearrangement unit 113 frame by frame, a field padding unit 158b for performing padding to the output PDg of the rearrangement unit 113 field by field, a primary switch 157a provided at a previous stage of these padding units, for supplying one of these padding units with the output PDg according to the sample identifier Di, and a secondary switch 157b provided at a next stage of these padding units, for selecting one of outputs PDg 1 and PDg 2 of the padding units according to the sample identifier Di. Constructions of the frame padding unit 158a and the field padding unit 158b are identical to those of the frame padding unit 128a and the field padding unit 128b of the third embodiment.

Please replace the paragraph beginning at page 67 line 25 with the following rewritten paragraph:

B55 Cont'd

Specifically, the image decoding apparatus 900a includes a data analyzing unit 902 for receiving a coded difference signal Eg of a target block to be decoded (target block), and performing analysis and variable length decoding to the coded difference signal Eg, a data expanding device 903 for expanding an output AEg of the data analyzing unit 902 and outputting an expanded image signal DEg, an adder 906 for adding te output DEg to a prediction image signal Pg2 of the target block, an inverse blocking unit 907 for integrating reproduced image signals of respective blocks as an output of PEg of the adder 906 and outputting an image output signal REg of a scanning line structure, and a predicting section 910a for producing the prediction image signal Pg2.

Please replace the paragraph beginning at page 68 line 14 with the following rewritten paragraph:

B56 Cont

The data expanding device 903 comprises an inverse quantizer 904 for inversely quantizing the output AEg of the data analyzing unit 902, and an IDCT unit 905 for performing IDCT (inverse

discrete cosine transform) as one type of inverse frequency transform, to the output DEg1 of the inverse quantizer 904, and outputting the expanded difference image signal DEg.

Please replace the paragraph beginning at page 68 line 21 with the following rewritten paragraph:

The predicting section 910a includes a padding device 920a for performing padding to the output PEg of the adder 906, a frame memory 909 which contains an output Pa of the padding device 920a as a reproduced image signal, and a motion compensating unit 911 for generating an address Add2 of the frame memory 909 according to an output Rg2 of the frame memory 909 and a motion vector MV of the block which has been decoded by the data analyzing unit 902, and reading a prediction image signal Pg2 of the target block from the frame memory 909 which contains recorded data Rg2 using the address Add2.

Please replace the paragraph beginning at page 69 line 6 with the following rewritten paragraph:

The padding device 920a includes a frame padding unit 921a for performing padding to the output PEg of the adder 906 frame by frame, a field padding unit 921b for performing padding to the output PEg field by field, a primary switch 922 provided at a previous stage of these padding units, for supplying one of them with the output PEg according to the sample identifier Di from the data analyzing unit 902, a secondary switch 923 provided at a next stage thereof, for selecting one of outputs Pa1 and Pa2 of respective padding units according to the sample identifier, and a pixel rearrangement unit 924 for rearranging pixels of the padded image signal as a selected signal Pas from the secondary switch 923.

Please replace the paragraph beginning at page 69 line 23 with the following rewritten paragraph:

When the compressively coded image signal Eg, for example, the bit stream 200 in figure 11 is input to the input terminal 901a, the data analyzing unit 902 performs variable length decoding

B59 cancel

to the coded image signal by analysis. The resulting decoded data is output to the data expanding device 903 as a compressed difference signal AEg in which a quantization step or a DCT coefficient has been compressed. The data analyzing unit 902 also outputs the motion vector MV and the sample identifier Di to the predicting section 910a.

Please replace the paragraph beginning at page 70 line 8 with the following rewritten paragraph:

B60 cancel

The data expanding device 903 expands the compressed difference signal to be restored to an expanded difference signal of the target block. Specifically, the inverse quantizer 904 inversely quantizes the compressed difference signal, and then the IDCT unit 905 performs inverse frequency transform to the output DEg1 of the quantizer 904, by transforming a signal in a frequency domain into a signal in a spatial domain.

Please replace the paragraph beginning at page 70 line 16 with the following rewritten paragraph:

B61 cancel

The motion compensating unit 911 generates the address Add2 for accessing the frame memory 909 according to motion vector MV from the data analyzing unit 902 and extracts the prediction image signal Pg2 of the target block from the reproduced image signal stored in the frame memory 909. The adder 906 adds the output DEg of the data expanding device to the prediction image signal Pg2 and outputs the reproduced image signal PEg of the target block.

Please replace the paragraph beginning at page 75 line 7 with the following rewritten paragraph:

B62 cont

In the predicting section 910b, there is provided a padding device 920b between a motion compensating unit 911 and an adder 906, for performing padding to a motion compensated prediction image signal Pg2 and supplying the resulting signal to the adder 906. The padding device 920b includes a frame padding unit 921a , a field padding unit 921b, a primary switch 922 for supplying one of these padding units with the prediction image signal Pg2 from the motion

B62 cont'd

compensating unit 911 according to the sample identifier Di, and a secondary switch 923 for selecting one of outputs of the padding units according to the sample identifier Di and outputting a selected signal to the adder 906.

Please replace the paragraph beginning at page 76 line 19 with the following rewritten paragraph:

B63 cont'd

Figure 16 is a block diagram showing an image decoding apparatus according to modification 2 of the fourth embodiment. An image decoding apparatus 900c according to the modification 2 of the fourth embodiment has constructions of the image decoding apparatus 900a of the fourth embodiment and the image decoding apparatus 900b of its modification 1 in combination. In other words, in addition to the predicting section 910a comprising the padding device 920a of the image decoding apparatus 900a of the fourth embodiment, the image decoding apparatus 900c includes an auxiliary padding device (second padding device) 920c2 provided at a next stage of the motion compensating unit 911, the output of which is output to the adder 906. Here it is assumed that constructions of the first and second padding devices 920c1 and 920c2 are identical to those of the padding device 920a of the fourth embodiment and the padding device 920b of the modification 1 of the fourth embodiment, respectively.

Please replace the paragraph beginning at page 77 line 11 with the following rewritten paragraph:

B64 cont'd

In the modification 2 of the fourth embodiment thus constructed, the first and second padding devices 920c1 and 920c can share padding, whereby padding can be preformed in the predicting section with higher efficiency.

Please replace the title beginning at page 79, line 2 with the following rewritten title:

Industrial Applicability